A SATELLITE COMMUNICATION SYSTEM CONSTITUTED WITH PRIMARY AND BACK-UP MULTI-BEAM SATELLITES

ABSTRACT OF THE DISCLOSURE

[0067] A satellite communication system for providing communications between user terminals and gateways constituted with *m* primary satellites. In one embodiment, *n* back up satellites are also provided. Further, each satellite, primary or back-up, is equipped to project *N/m* beams onto and across an area in a loosely-packed array manner. *M* of the *m* primary and *n* back-up satellites collectively create *N* beam spots to cover the area. Moreover, each sub-area is covered by a beam spot separated from another sub-area covered by another beam spot by one beam width. Each satellite is also equipped to facilitate communication over 1 of *m* band of frequencies on one beam. AS a result, any of the *m* primary satellites may be efficiently replaced on demand by a selected one of the *n* back-up satellites. The gateways and user terminals are configured to communicate signals through or with both or either the primary and back-up satellites.